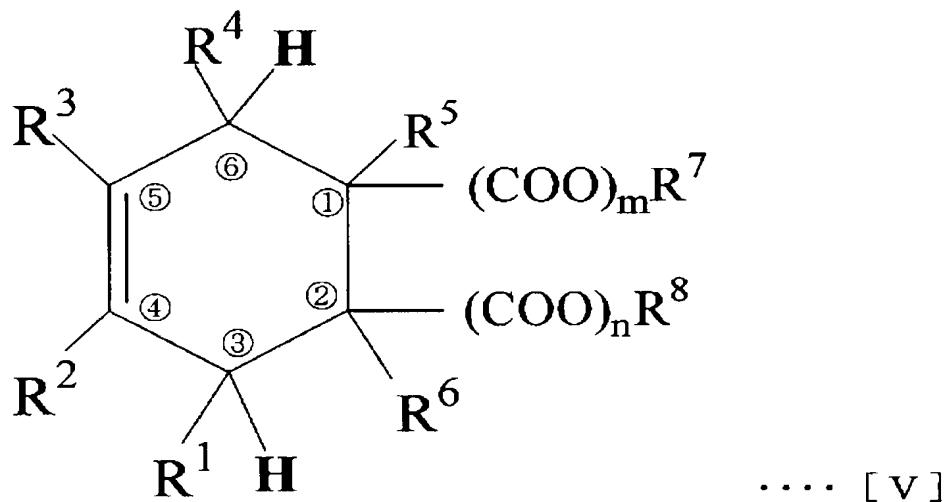


## CLAIMS:

1. A novel cycloalkenylcarboxylic acid represented by the following formula [V] or a novel bicycloalkenylcarboxylic acid represented by the  
 5 following formula [VI] or a salt thereof:

[Compound 1]



wherein R<sup>1</sup> is a hydrogen atom, a 3-methyl-2-butenyl group or a 2-methyl-1-propenyl group,

10 when R<sup>1</sup> is a hydrogen atom, R<sup>2</sup> is a 4-methyl-3-pentenyl group and R<sup>3</sup> and R<sup>4</sup> are each a hydrogen atom,

when R<sup>1</sup> is a 3-methyl-2-butenyl group, R<sup>2</sup> is a methyl group and R<sup>3</sup> and R<sup>4</sup> are each a hydrogen atom,

when R<sup>1</sup> is a 2-methyl-1-propenyl group, R<sup>2</sup> is a hydrogen atom and R<sup>3</sup> and R<sup>4</sup> are each a methyl group,

$R^5$  and  $R^6$  are each a hydrogen atom or an alkyl group of 1 to 10 carbon atoms,

$m$  and  $n$  are each a number of 0 or 1 (with the proviso that it does not occur that  $m$  and  $n$  are 0 at the same time),

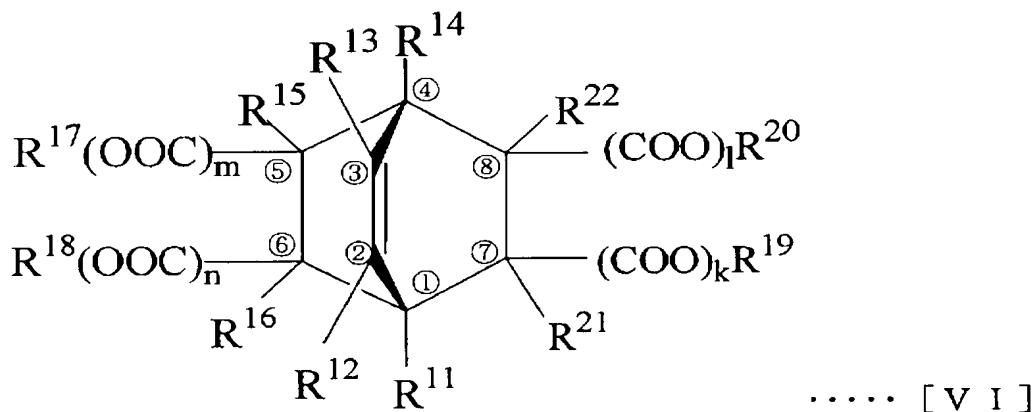
$R^7$  and  $R^8$  are each a hydrogen atom or a hydrocarbon group,

when  $m$  is 0,  $R^7$  is a hydrogen atom,

when  $m$  is 1,  $R^7$  is a hydrogen atom or a hydrocarbon group,

when  $n$  is 0,  $R^8$  is a hydrogen atom, and  
when  $n$  is 1,  $R^8$  is a hydrogen atom or a hydrocarbon group (with the proviso that it does not occur that  $R^7$  and  $R^8$  are hydrocarbon groups at the same time);

15 [Compound 2]



wherein any one of  $R^{11}$  and  $R^{16}$  is an isopropyl group,

[A] in the case where  $R^{11}$  is an isopropyl group,

$R^{12}$  and  $R^{13}$  are each a hydrogen atom,

$R^{14}$  is a methyl group,

$R^{15}$  and  $R^{16}$  are each a hydrogen atom or an alkyl group of 1 to 10 carbon atoms,

5         $m$  and  $n$  are each a number of 0 or 1 (with the proviso that it does not occur that  $m$  and  $n$  are 0 at the same time),

$R^{17}$  and  $R^{18}$  are each a hydrogen atom or a hydrocarbon group,

10         $k$  and  $l$  are each 0,

$R^{19}$  and  $R^{20}$  are each a hydrogen atom,

$R^{21}$  and  $R^{22}$  are each a hydrogen atom or an alkyl group of 1 to 10 carbon atoms,

when  $m$  is 0,  $R^{17}$  is a hydrogen atom,

15        when  $m$  is 1,  $R^{17}$  is a hydrogen atom or a hydrocarbon group,

when  $n$  is 0,  $R^{18}$  is a hydrogen atom, and

when  $n$  is 1,  $R^{18}$  is a hydrogen atom or a hydrocarbon group (with the proviso that it does not

20        occur that  $R^{17}$  and  $R^{18}$  are hydrocarbon groups at the same time), and

[B] in the case where  $R^{16}$  is an isopropyl group,

$R^{11}$  and  $R^{12}$  are each a hydrogen atom,

$R^{13}$  is a methyl group,

$R^{14}$  is a hydrogen atom,

$R^{15}$  is a hydrogen atom or an alkyl group of 1 to 10 carbon atoms,

$m$  and  $n$  are each 0,

5        $R^{17}$  and  $R^{18}$  are each a hydrogen atom,

$k$  and  $l$  are each a number of 0 or 1 (with the proviso that it does not occur that  $k$  and  $l$  are 0 at the same time),

10       $R^{19}$  and  $R^{20}$  are each a hydrogen atom or a hydrocarbon group,

$R^{21}$  and  $R^{22}$  are each a hydrogen atom or an alkyl group of 1 to 10 carbon atoms,

      when  $k$  is 0,  $R^{19}$  is a hydrogen atom,

      when  $k$  is 1,  $R^{19}$  is a hydrogen atom or a hydrocarbon group,

15      when  $l$  is 0,  $R^{20}$  is a hydrogen atom, and

      when  $l$  is 1,  $R^{20}$  is a hydrogen atom or a hydrocarbon group (with the proviso that it does not occur that  $R^{19}$  and  $R^{20}$  are hydrocarbon groups at the same time).

2. The cycloalkenylcarboxylic acid or the bicycloalkenylcarboxylic acid or the salt thereof as claimed in claim 1, wherein the cycloalkenylcarboxylic

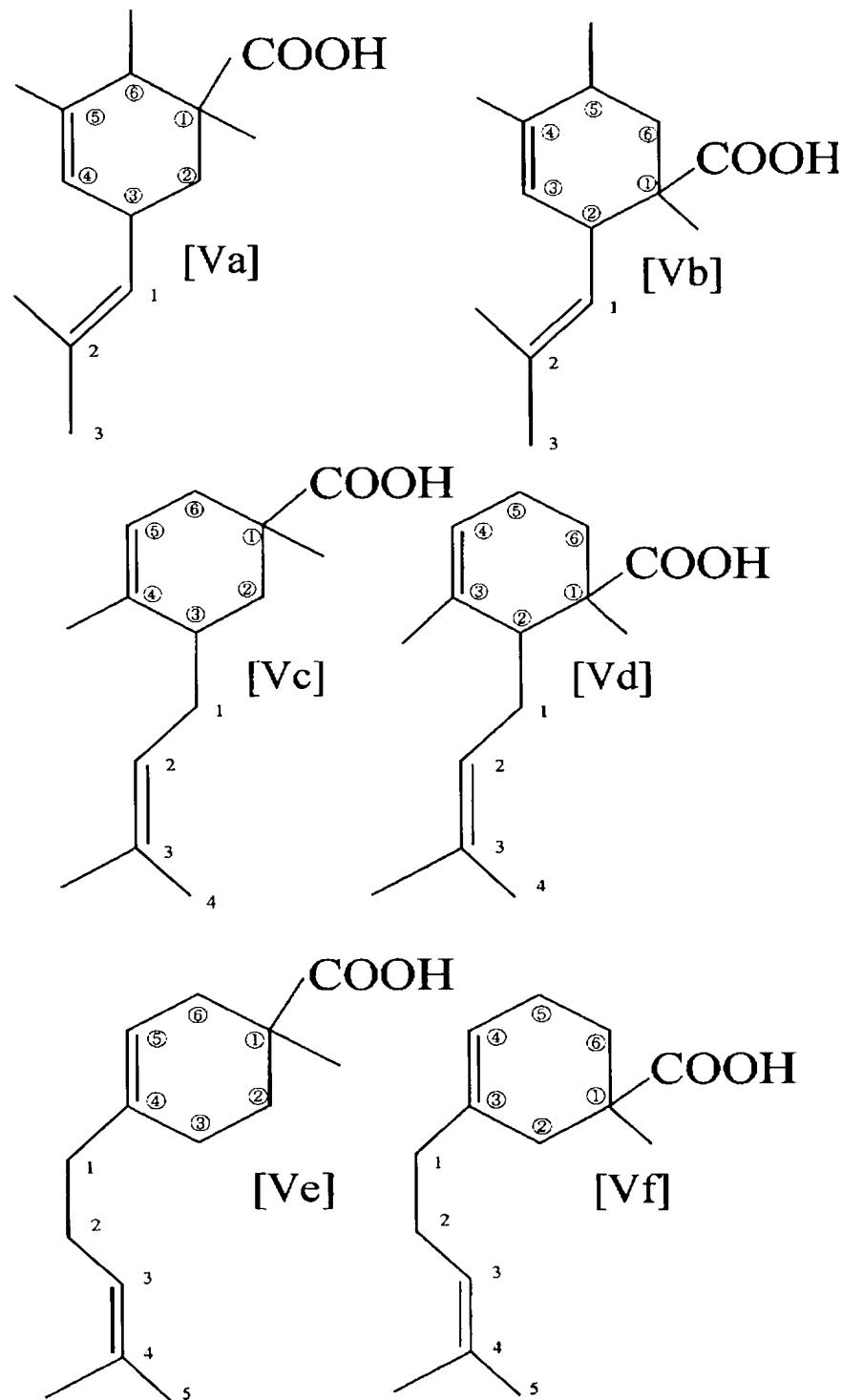
acid represented by the formula [V] is represented by the following formula [Va], [Vb], [Vc], [Vd], [Ve], [Vf], [Vg] or [Vh], and the bicycloalkenylcarboxylic acid represented by the formula [VI] is represented by the 5 following formula [VIa], [VIb], [VIc] or [VID], in said formulas, a hydrogen atom bonded to a carbon atom being omitted;

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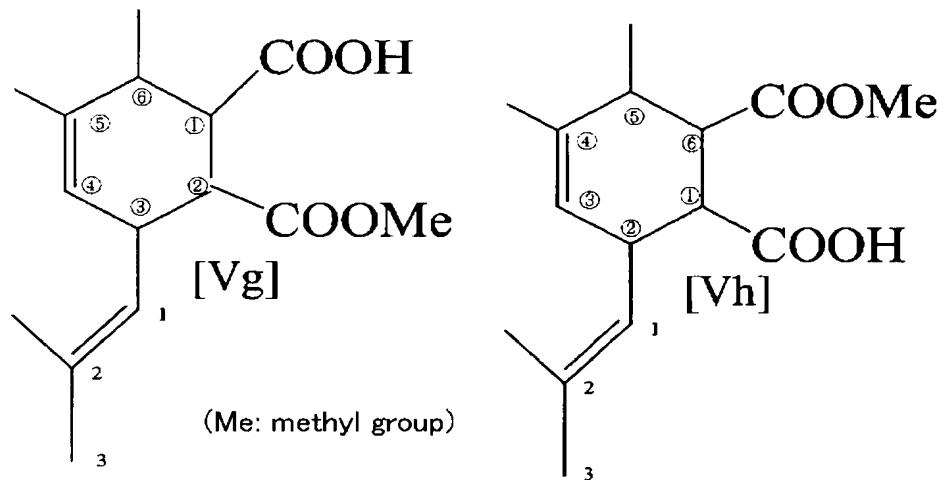
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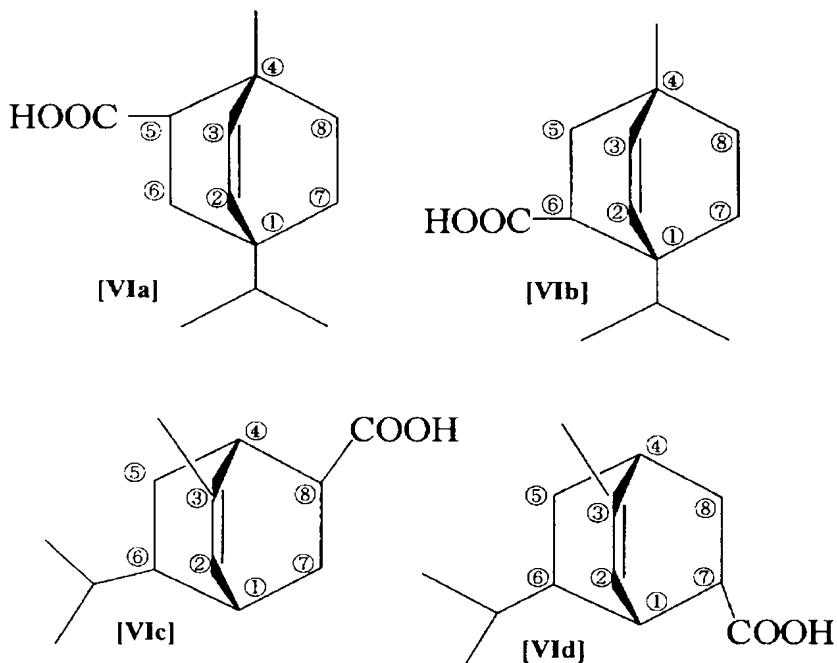
[Compound 3]



[Compound 4]



[Compound 5]



5 wherein Me is a methyl group.

3. A process for preparing the cycloalkenylcarboxylic acid or the bicycloalkenylcarboxylic acid of any one of claims 1 and 2, comprising subjecting [J] at least one terpene-based 5 diene compound (conjugated diene compound) selected from the group consisting of alloocimene, ocimene, myrcene,  $\alpha$ -terpinene and  $\alpha$ -phellandrene and [K] at least one unsaturated carboxylic acid selected from  $\alpha$ ,  $\beta$ -unsaturated monocarboxylic acids and monoesters of  $\alpha$ ,  $\beta$ -10 unsaturated dicarboxylic acids to addition reaction.

4. A compounding agent for an antifouling paint, comprising one or more substances selected from a cyclic carboxylic acid formed by the addition reaction of an 15 unsaturated carboxylic acid with a conjugated diene compound, a derivative of the cyclic carboxylic acid (except a metal salt), a metal salt of the cyclic carboxylic acid, and a metal salt of a derivative of the cyclic carboxylic acid.

20

5. The compounding agent for an antifouling paint as claimed in claim 4, wherein the cyclic carboxylic acid, the derivative of the cyclic carboxylic acid (except a metal salt), the metal salt of the cyclic carboxylic acid,

or the metal salt of a derivative of the cyclic carboxylic acid is the cycloalkenylcarboxylic acid or the bicycloalkenylcarboxylic acid or the salt thereof of any one of claims 1 and 2.

5

6. An antifouling paint composition comprising:

(A) the compounding agent for an antifouling paint of any one of claims 4 and 5, and

(B) a copolymer for a self-polishing type

10 antifouling paint.

7. The antifouling paint composition as claimed in claim 6, further comprising (C) an antifouling agent.

15 8. The antifouling paint composition as claimed in claim 7, wherein (C1) copper or a copper compound is contained as the antifouling agent (C).

9. The antifouling paint composition as claimed in 20 any one of claims 7 and 8, wherein (C2) an organic antifouling agent (except copper or the copper compound (C1)) is contained as the antifouling agent (C).

10. The antifouling paint composition as claimed  
in any one of claims 6 to 9, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
polymerizable unsaturated carboxylic acid hydroxy metal  
5 salt-based copolymer.

11. The antifouling paint composition as claimed  
in any one of claims 6 to 10, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
10 copolymer having, in a molecule, a constituent unit  
derived from a polymerizable unsaturated carboxylic acid  
hydroxy metal compound represented by the following  
formula [I] :



15 wherein  $R^1$  is an unsaturated bond-containing organic  
group of  $CH_2=C(CH_3)-$ ,  $CH_2=CH-$ ,  $HOOC-CH=CH-$  or  $HOOC-$   
 $CH=C(CH_3)-$ ,  $-COOH$  may form a metal salt or an ester, and  
M is a metal atom.

20 12. The antifouling paint composition as claimed  
in any one of claims 6 to 11, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
copolymer having, in a molecule, a constituent unit  
derived from a (meth)acrylic acid hydroxy metal salt.

13. The antifouling paint composition as claimed  
in any one of claims 6 to 12, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
5 copolymer having, in a molecule, a constituent unit  
derived from a (meth)acrylic acid hydroxy zinc salt or  
copper salt.

14. The antifouling paint composition as claimed  
10 in any one of claims 6 to 13, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
polymerizable unsaturated carboxylic acid metal compound-  
based copolymer having a constituent unit derived from a  
polymerizable unsaturated carboxylic acid metal compound  
15 containing no hydroxyl group bonded to a metal atom.

15. The antifouling paint composition as claimed  
in any one of claims 6 to 14, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
20 copolymer having, in a molecule, a constituent unit  
derived from a polymerizable unsaturated carboxylic acid  
metal compound represented by the following formula [II] :



wherein R<sup>1</sup> is an unsaturated bond-containing organic group of CH<sub>2</sub>=C(CH<sub>3</sub>)-, CH<sub>2</sub>=CH-, HOOC-CH=CH- or HOOC-CH=C(CH<sub>3</sub>)-, -COOH may form a metal salt or an ester, M is a metal atom, L is an organic acid residue -OCOR<sup>2</sup> (R<sup>2</sup> is 5 an alkyl group, a cycloalkyl group, an aromatic hydrocarbon group which may have a substituent, or an aralkyl group), and n is a number of "valence of the metal M(-1)".

10 16. The antifouling paint composition as claimed in any one of claims 6 to 15, wherein the copolymer (B) for a self-polishing type antifouling paint is a copolymer having a constituent unit derived from a (meth)acrylic acid metal compound containing no hydroxyl 15 group bonded to a metal atom.

17. The antifouling paint composition as claimed in any one of claims 6 to 16, wherein the copolymer (B) for a self-polishing type antifouling paint is a 20 copolymer having a constituent unit derived from a (meth)acrylic acid zinc salt or copper salt containing no hydroxyl group bonded to a zinc atom or a copper atom.

18. The antifouling paint composition as claimed  
in any one of claims 6 to 17, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
polymerizable unsaturated carboxylic acid metal salt-based  
5 copolymer obtained by copolymerizing (a) a (meth)acrylic  
acid zinc salt or copper salt monomer and (b) another  
monomer copolymerizable with the monomer (a) and  
containing constituent units derived from the  
(meth)acrylic acid zinc salt or copper salt monomer (a)  
10 in amounts of 2 to 50% by weight and constituent units  
derived from the copolymerizable another monomer (b) in  
amounts of 50 to 98% by weight (constituent units (a) +  
constituent units (b) = 100% by weight).

15 19. The antifouling paint composition as claimed  
in any one of claims 6 to 18, wherein the copolymer (B)  
for a self-polishing type antifouling paint is a  
polymerizable unsaturated carboxylic acid silyl ester-  
based copolymer.

20

20. The antifouling paint composition as claimed  
in claim 19, wherein the copolymer (B) for a self-  
polishing type antifouling paint is a copolymer having,  
in a molecule, a constituent unit derived from a silyl

unsaturated carboxylate monomer and a constituent unit derived from an unsaturated monomer copolymerizable with the silyl unsaturated carboxylate monomer, said silyl unsaturated carboxylate monomer being represented by the 5 following formula [IIIA]:



wherein  $R^1$  is an unsaturated bond-containing organic group of  $CH_2=C(CH_3)-$ ,  $CH_2=CH-$ ,  $HOOC-CH=CH-$  or  $HOOC-CH=C(CH_3)-$ ,  $-COOH$  may form a metal salt or an ester,  $L^1$ , 10  $L^2$  and  $L^3$  may be the same or different and are each independently a hydrogen atom, an alkyl group, a cycloalkyl group, an aromatic hydrocarbon group, an aralkyl group or an alkylsilyloxy group, and these groups may have a substituent.

15

21. The antifouling paint composition as claimed in any one of claims 19 to 20, wherein the copolymer (B) for a self-polishing type antifouling paint is a copolymer obtained by copolymerizing silyl (meth)acrylate 20 and an unsaturated monomer copolymerizable with the silyl (meth)acrylate.

22. An antifouling coating film formed from the antifouling paint composition of any one of claims 6 to 21.

5 23. A ship or an underwater structure coated with a coating film formed from the antifouling paint composition of any one of claims 6 to 21.

10 24. A fishing tackle or a fishing net coated with a coating film formed from the antifouling paint composition of any one of claims 6 to 21.

15 25. An antifouling method for a ship or an underwater structure, comprising coating a surface of a ship or an underwater structure with a coating film comprising the antifouling paint composition of any one of claims 6 to 21.

20 26. An antifouling method for a fishing tackle or a fishing net, comprising coating a surface of a fishing tackle or a fishing net with a coating film comprising the antifouling paint composition of any one of claims 6 to 21.